

CLAIMS

1. An EL fiber having a function of emitting ultraviolet light or visible light with a wavelength of 400 nm or less, the EL fiber characterized in that the cross-sectional structure of the fiber comprises an internal electrode located at the center in a radius direction, an internal insulating layer disposed around the internal electrode, a light-emitting layer, an external electrode, and a protective layer disposed on an outermost surface, and the light is emitted by application of an alternating current electric field between the electrodes.
2. The EL fiber according to Claim 1, wherein an external insulating layer is disposed between the light-emitting layer and the external electrode.
3. An EL fiber having a function of emitting ultraviolet light or visible light with a wavelength of 550 nm or less, the EL fiber characterized in that the cross-sectional structure of the fiber comprises an internal electrode located at the center in a radius direction, an internal insulating layer disposed around the internal electrode, a light-emitting layer, an external electrode, a protective layer, and a particle layer or a thin film disposed on an outermost surface and formed from a material having a photocatalytic function, and the light is emitted by application of an alternating current electric field between the electrodes.
4. The EL fiber according to Claim 3, wherein an external insulating layer is disposed between the light-emitting layer and the external electrode.
5. The EL fiber according to Claim 3 or Claim 4, wherein the protective layer

itself is formed from a material having a photocatalytic function.

6. The EL fiber according to any one of Claims 3 to 5, wherein the material having a photocatalytic function is TiO_2 and/or TiO_2 doped with at least one type of element of N, S, Mn, Fe, Co, Zn, and Cu.

5 7. The EL fiber according to any one of Claims 1 to 4, wherein the light-emitting layer has a structure in which fluophor particles having a function of emitting visible light or ultraviolet light are dispersed in a matrix containing at least one type of a dielectric resin and a dielectric ceramic.

8. The EL fiber according to any one of Claims 1 to 4, wherein the fluophor
10 constituting the light-emitting layer containing ZnS as a first primary component and, as second components, a first additional element constituting an acceptor level and a second additional element constituting a donor level in a semiconductor partly including or not including a group II-IV compound semiconductor.

15 9. The EL fiber according to Claim 8, wherein the first additional element is at least one type of Cu, Ag, Au, Li, Na, N, As, P, and Sb, and the second additional element is at least one type of Cl, Al, I, F, and Br.

10. The EL fiber according to Claim 8, wherein the first additional element is Ag.

20 11. The EL fiber according to Claim 8, wherein the semiconductor of the second component contains at least one type of MgS, CaS, SrS, BeS, and BaS.

12. The EL fiber according to any one of Claims 1 to 4, wherein the average particle diameter of the fluophor constituting the light-emitting layer is 10 nm

or less.

13. A photocatalytic reactor comprising the EL fiber according to any one of Claims 1 to 4.

14. A photocatalytic reactor having a structure in which the EL fiber
5 according to any one of Claims 1 to 4 and a photocatalytic fiber are combined in alternate position.